

REMARKS

Claims 1-13 are all the claims pending in the application. Claims 1 and 4 are herein amended. New claims 7-13 have been added. No new matter is added.

I. Specification

The Examiner objected to the specification for the title of the invention as not being descriptive. Applicant herein amends the title to --METHOD AND APPARATUS FOR CAPTURING IMAGE WITH IMPROVING SENSITIVITY-- .

Applicant respectfully requests the Examiner to withdraw this objection.

II. Prior Art Rejections - 35 U.S.C. § 103

The Examiner rejected claims 1-6 under 35 U.S.C. § 103 as allegedly being unpatentable over Inai (US 4,437,111) in view of Konishi (US 4,774,564). Applicant traverses.

A. No Motivation For The Suggested Modification

The Examiner conceded that “Inai fails to disclose that when the brightness is below or above the set level, the corresponding intensity of color separating process is increased or decreased.” (Office Action 4th full paragraph, page 3).

The Examiner also noted that “Konishi teaches an electronic still camera wherein the intensity of the RGB/color separating process is set to a predetermined level if it is possible (Figs. 6 and 7) or disengaged and continued in manual mode (col. 13, lines 47-53). Konishi further teaches that the gains of the G and B signals of the color separating process are increased when color temperature detects low light; otherwise the system is disengaged...In light of the teaching from Konishi, it would have been obvious to one of ordinary skill in the art at the time the invention was [made] to increase or decrease the intensity of the color separating process taught by Konishi...to provide an improved camera capable of **controlling the gain-variable** independently with respect to the three primary colors in dependence upon the measured color temperature...[emphasis added]” (Office Action carry-over paragraph, pages 3-4).

Konishi teaches “color video signals in which the output level of the G- or luminance signals is maintained at a constant level without dependency on the color temperature and in which the white balance is adjusted to an optimum state. This is realized by controlling the gains of the variable-gain amplifiers for white balance adjustment independently with respect to the three primary colors...or by adjusting the light exposure by adjusting the diaphragm and the shutter...” (col. 3, lines 44-53). Konishi then teaches a “variable amplification means for amplifying color-separated components of the video signals and having adjustable amplification gains for respective ones of the color-separated components” (col. 4, lines 40-43).

Applicant submits that the teachings of Konishi do not overcome the problems of conventional devices such as blurring and noise. Namely, the teachings of Konishi are disadvantageous in that Konishi teaches color separation by increasing the gain using amplifiers, which potentially add noise to the image signal thereby deteriorating the image. Konishi also teaches adjusting the shutter speed to increase sensitivity, which potentially causes blurring. Even if Konishi were modified in a manner to remove these problems, Konishi would consequently not be suitable for its intended purpose.

In view of the problems caused by the teachings of Konishi, Applicant submits that one skilled in the art would not be motivated to combine aspects of Inai with Konishi to arrive at the features of independent claims 1 and 4.

Further, in Inai, inserting or removing the infrared cut filter is based on the brightness of the scenery¹. However, in Konishi, controlling the variable gains for color separation is independent of light intensity² (brightness) but is instead, dependent upon white balance. Also, Konishi teaches that light intensity and white balance do not depend upon each other³. Therefore, there is no motivation to combine Inai with Konishi, because determining when to

¹ Inai col. 3, lines 1-8; *See also*, Inai col. 2, lines 51-67.

² *See* Konishi col. 1, lines 21-29.

³ *See* Konishi col. 1, lines 59-63.

insert or remove the infrared cut filter, and determining when to vary the gains for color separation are not based upon the same conditions.

B. Claimed Features Not Met

Even if combined, the references would not meet the features of herein amended independent claims 1 and 4. The following remarks are for claim 1, but apply by analogy to claim 4. Claims 1 includes:

when the sensitivity of said image capturing device is insufficient, relatively increasing both an overlapping region of spectral sensitivity of said image capturing device and intensity of said color separating process; and

when the sensitivity of said image capturing device is sufficient, relatively decreasing at least one of the overlapping region of the spectral sensitivity of said image capturing device and the intensity of said color separating process.

Konishi teaches “[w]hen it is determined at step 200 that the EE system should remain out of operation, it is determined at step 212 whether the G-signal can be maintained at a predetermined constant level and the white balance can be adjusted, judging from the incident light intensity sensed by the device 36 and the light volume of each of the R, G and B color components based on the color temperature sensed by the color temperature sensor 78 [emphasis added].” (col. 13, lines 19-26). In other words, the color separation process in Konishi is based on whether the G-signal can be maintained at a constant level in view of white balance and color temperature.

In reasoning that Konishi teaches when the sensitivity of the image capturing device is insufficient or sufficient then the intensity of the color separating process is increased or decreased respectively, the Examiner noted that “the gains of G and B signals of the color separating process are increased when color temperature detects low light; otherwise, the system is disengaged to complete photographing in the manual mode.⁴” One skilled in the art would

⁴ See Office Action carry-over paragraph, pages 3-4.

understand that a color separating process that requires increasing the gain causes the potential problem of noise. Besides, the increase in gain is not based on the insufficiency of sensitivity for the image capturing device. Also, the EE system is disengaged when “it is not possible to render the G-signal at a predetermined constant level and to adjust the white balance” (col. 13, lines 47-53). This disengagement, likewise, is not based on the sufficiency of sensitivity for the image capturing device.

Therefore, for the above reasons Applicant submits that, even combined, Inai and Konishi do not teach or suggest that increasing or decreasing the intensity of said color separating process is based on the sufficiency or insufficiency in sensitivity of the image capturing device. Unlike the combined teachings of Inai and Konishi, the disclosure of claim 1 takes into consideration the negative effects of deterioration in image quality due to an increase in noise caused by applying more voltage to the CCD (increasing the gains of the components R, G, and B), and the disclosure of claim 1 has an object to compensate for insufficiency of the sensitivity without increasing the possibility of lens movement and noise generation. Since the references fail to render the subject matter of claim 1 unpatentable, Applicant respectfully requests the Examiner to withdraw this rejection of independent claims 1 and 4, and their dependent claims 2 and 3 and 5 and 6, respectively.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.


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